

REMARKS

Claims 1-7 are now pending. No claims stand allowed.

Claims 1-2, 4, and 7 have been amended to further particularly point out and distinctly claim subject matter regarded as the invention. The text of claims 3 and 5-6 is unchanged, but their meaning is changed because they depend from the amended claims. The amendment to claims also contains minor changes of a clerical nature. New claims 8-9 have been added by this amendment and also particularly point out and distinctly claim subject matter regarded as the invention. The new claims are supported by disclosure in FIG. 7 of the present application.

The specification has been amended to correct minor informalities noted in the Office Action. No “new matter” has been added by the amendment.

Objection to Disclosure

The specification stands objected for certain informalities, as reference labels (CL) in FIGS. 7 and 9 need to be described relative to the corresponding drawings figure.

Regarding FIG. 7, the specification has been amended such that the reference label of the centerline (CL) is mentioned in the description. Regarding FIG. 9, it is respectfully submitted that the specification had been amended by the previous response filed on September 3, 2002 such that the reference label of the centerline (CL) in FIG. 9 is mentioned in the description (see page 6, the first line of the previous response). Accordingly, withdrawal of the objection is respectfully requested.

Claim Objection

Claim 2 stand objected to as --is-- should be inserted before “defined.” Claim 2 has been amended to correct the informality. Withdrawal of the objection is respectfully requested.

The 35 U.S.C. § 102 Rejection

Claims 1-3 stand rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Berwick (U.S. Pat. No. 4,387,322). This rejection is respectfully traversed.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”

Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 869 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). *See also*, M.P.E.P. § 2131.

Claim 1, as amended, defines a high power output vacuum electron device including a magnet which includes a magnet pole piece surrounding the anode and the RF generation circuit for focusing the electrons into a collimated beam. The magnet includes no magnet pole piece in vicinity of a region of the collector, and a magnetic material surrounding the collector region is disposed such that substantially no magnetic field reversal is present at the collector region, as recited in claim 1 as amended.

Berwick discloses in FIG. 2 thereof a linear-beam electron tube having a gun-magnet 10' and omitting a collector side magnet. However, as shown in FIG. 2 of Berwick, the output pole piece 13' only surrounds the very entrance of the collector 24', and there is no magnetic material surrounding the collector region 23' in Berwick. Thus, in accordance with Berwick's configuration, as shown in FIG. 3 thereof, a substantial magnetic field reversal still exists in the collector region. Accordingly, Berwick fails to disclose a magnetic material surrounding the collector region such that no magnetic field reversal is present at the collector region, as claimed in claim 1.

Therefore, it is respectfully requested that the rejection of claims based on Berwick be withdrawn.

The 35 U.S.C. § 103 Rejection

Claims 4-6, and 7 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Berwick in view of Kosmahl (U.S. Pat. No. 3,764,850). This rejection is respectfully traversed.

According to M.P.E.P. § 2143,

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

Claims 4 and 7, as emended, include the same distinctive features as claim 1 that there is no magnet pole piece in vicinity of a region of the collector, and a magnetic material surrounds the collector region such that substantially no magnetic field reversal is present at the collector region.

Koshmahl is only relied on by the Examiner to provide a magnetic focussing structure and a multi-stage depressed collector for a microwave tube. Koshmahl neither teaches nor suggests providing a magnetic material surrounding the collector region such that substantially no magnetic field reversal is present at the collector region, as claimed in claim 4 and 7. Therefore, Berwick and Koshmahl, whether considered alone or combined together, do not render the claimed invention obvious.

Accordingly, it is respectfully requested that the rejection of claims based on Berwick and Koshmahl be withdrawn. In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Dependent Claims

Claims 2-3 and 5-6 depend directly or indirectly from claims 1 and 4, respectively, and thus include the all limitations of the corresponding base claim. The argument set forth above is equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Request for Allowance

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

Request for Entry of Amendment

Entry of this Amendment will place the Application either in condition for allowance or at least, in better form for appeal by narrowing any issues. Accordingly, entry of this Amendment is appropriate and is respectfully requested.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.

Respectfully submitted,
THELEN REID & PRIEST, LLP

Dated: January 30, 2003


Masako Ando

Limited Recognition under 37 CFR §10.9(b)

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Version of Paragraph with Markings to Show Changes Made

Page 15, the first paragraph (lines 1-9)

Figure 7 is a simulation of electrons entering the four stage multistage depressed collector. As shown in Figure 7, the electrons enter from the left, as the centerline (CL) of the tube is shown as the horizontal axis in the figure. The vertical axis is the dimension of the actual copper forming the various four stages of the multistage depressed collector. The magnetic field is seen, as well. The equal potential lines are seen and the magnetic field lines at collector stages 1, 2, 3, and 4 are horizontal indicating no flux reversal. Thus, the pattern of the electrons impinging upon the various stages of the collector in this multistage depressed collector is even as intended so that the heat is more adequately dispersed and the problem of hot spots is eliminated.

Version of Claims with Markings to Show Changes Made

1. (Twice Amended) A high power output vacuum electron device comprising:
- a cathode for emitting a supply of electrons,
 - an anode for attracting said electrons, said anode having a configuration to allow said electrons to pass through said anode,
 - an RF generator circuit in the path of said electron beam for generating RF signal energy in the presence of a high-voltage power source,
 - a magnet including a magnet pole piece surrounding said anode and said RF generation circuit for focusing said electrons into a collimated beam, and
 - a collector for receiving the collimated electron beam and for returning the electrons to the cathode, said collector is a multi-stage depressed collector which is shielded from the magnetic field from said magnet, [said magnet only disposed at an end of said anode opposite to said collector]
- wherein said magnet includes no magnet pole piece in ^{the} vicinity of a region of said collector, a magnetic material surrounding the collector region being disposed such that substantially no magnetic field reversal is present at the collector region.

2. (Twice Amended) The vacuum electron device of Claim 1 wherein said collector is defined by a region which is free of any magnetic fields such that the electron beam naturally disperses to evenly deposit said electrons on inner walls of said collector, said collector being thereby free of hot spots due to uneven electron deposition thereon.

4. (Twice Amended) A vacuum electron device including a source of electrons, said electrons being configured into a narrow beam, and a multi-stage depressed collector for collecting said electrons, the improvement comprising:

a magnet arrangement surrounding and focusing said narrow beam, the magnetic flux of said magnet arrangement being parallel to and collinear with the centerline of said electron beam, said magnet arrangement having a first open pole piece adjacent to the area of said source of electrons to initially focus said electron beam, and a second open pole piece [open pole pieces] along said centerline to focus and drive said electron beam, [said magnet having open pole pieces adjacent to the area of said source of electrons to initially focus said electron beam,] said magnet having no open magnet pole piece[s] in the vicinity of said multi-stage depressed collector so that any magnetic flux from the magnet is directed back into the body of said magnet, and

a magnetic material surrounding the collector region such that substantially no magnetic field reversal is present at the collector region.

7. (Twice Amended) A gun only magnet utilized in a multi-stage depressed collector high-energy vacuum electron device comprising:

a first pole piece region generating magnetic flux adjacent a cathode of said vacuum electron device to drive and initially focus electrons emitted from said cathode, [and]

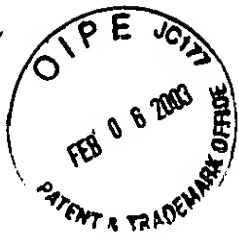
a second pole piece region providing magnetic flux along the path of electrons to focus said electrons into a narrow beam, said magnet having no pole magnet piece in the

region of said vacuum electron device where the electrons are collected and returned to said cathode, and

a magnetic material surrounding the collector region such that substantially no magnetic field reversal is present at the collector region.

8. (New) The vacuum electron device of Claim 1 wherein the magnetic field includes a refocusing region in vicinity of an entrance to said collector region.

9. (New) The vacuum electron device of Claim 4 wherein said magnet arrangement further generates a refocusing magnetic field in vicinity of an entrance to said collector region.



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Expires: June 11, 2003

Harry I. Moatz
Director of Enrollment and Discipline